

What is claimed is:

1. A gas sensor having a length with a first and a second end opposed to each other comprising:

5 a hollow cylindrical housing having a first end and a second end <sup>10</sup>opposed to the first and second ends of the gas sensor, respectively;

a sensing element <sup>15</sup>retained within said housing which has a length extending in a longitudinal direction of the gas sensor,

10 including a sensing portion working to measure a concentration of a specified gas; and

a cover assembly <sup>2</sup>installed on the second end of said housing to define a gas chamber <sup>200</sup>in which the sensing portion of said sensing element is disposed and into which the specified gas is admitted,

15 said cover assembly having a length extending in the longitudinal direction of the gas sensor, including an outer <sup>21</sup>and an inner <sup>22</sup>cover, the outer cover having a first gas inlet <sup>210</sup>hole formed in a side wall thereof, the inner cover having formed in a side wall thereof a second gas inlet <sup>220</sup>hole which is located closer to the first end of the gas sensor

20 than the first gas inlet hole of the outer cover, the inner cover being disposed within the outer cover with a given <sup>25</sup>clearance between the outer and inner covers, at least one of the outer and inner covers being geometrically designed to define a gas path within the clearance which establishes a flow of the specified gas from the first gas inlet hole to the gas chamber through the second gas inlet hole  
25 for minimizing interference of a return gas flow produced within the

clearance, oriented toward the first gas inlet hole with the flow of the specified gas into the gas chamber along the gas path.

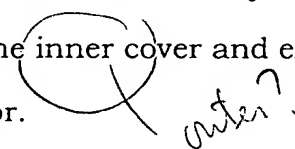
2. A gas sensor as set forth in claim 1, wherein one of the outer  
5 and inner covers of said cover assembly has formed on the side wall thereof a shoulder which separates the clearance between the outer and inner covers into a wider and a narrower portion.

3. A gas sensor as set forth in claim 1, wherein the clearance  
10 formed between the outer and inner covers is made up of a narrower portion and a wider portion 1.1 times wider than the narrower portion.

4. A gas sensor as set forth in claim 3, wherein the wider  
15 portion is located around the second gas inlet hole of the inner cover.

5. A gas sensor as set forth in claim 1, wherein the inner cover  
has a gas flow-opposed wall oriented upstream of the gas path, the  
second gas inlet hole being formed in the gas flow-opposed wall.

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6. A gas sensor as set forth in claim 5, wherein the gas  
flow-opposed wall is defined by a shoulder<sup>221</sup> which is formed on the  
side wall of the inner cover and extends outward to the first end of  
the gas sensor. 

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7. A gas sensor as set forth in claim 1, further comprising a

fig. 10

fig. 15  
 groove<sup>215</sup> formed in the side wall of the outer cover serving to direct the flow of the specified gas to the second gas inlet hole of the inner cover.

- 5 8. A gas sensor having a length with a first and a second end opposed to each other comprising:

a hollow cylindrical housing having a first end and a second end <sup>constantly</sup> (opposed) to the first and second ends of the gas sensor, respectively;

- 10 a sensing element retained within said housing which has a length extending in a longitudinal direction of the gas sensor, including a sensing portion working to measure a concentration of a specified gas; and

- a cover assembly installed on the second end of said housing  
 15 to define a gas chamber in which the sensing portion of said sensing element is disposed and into which the specified gas is admitted, said cover assembly having a length extending in the longitudinal direction of the gas sensor, including an outer and an inner cover, the outer cover having a first gas inlet hole formed in a side wall  
 20 thereof, the inner cover having a tapered<sup>222</sup> surface formed on a side wall thereof which tapers off to a side of the second end of the gas sensor, the inner cover having formed in the tapered surface thereof a second gas inlet hole<sup>220</sup> which is located closer to the first end of the gas sensor, than the first gas inlet hole of the outer cover, the inner  
 25 cover being disposed within the outer cover with a given clearance<sup>25</sup> between the outer and inner covers which defines a gas path

establishing a flow of the specified gas from the first gas inlet hole to the gas chamber through the second gas inlet hole.

9. A gas sensor as set forth in claim 8, wherein the outer cover  
5 has formed on the side wall thereof a surface which tapers off to a side of the first end of the gas sensor to define a wider portion of the clearance between the tapered surface of the inner cover and the tapered surface of the outer cover.

10. A gas sensor as set forth in claim 8, wherein the inner cover  
10 has a straight surface continuing from the tapered surface, extending straight in the longitudinal direction of the gas sensor.

11. A gas sensor as set forth in claim 8, further comprising a  
15 groove formed in the side wall of the outer cover serving to direct the flow of the specified gas to the second gas inlet hole of the inner cover.

12. A gas sensor as set forth in claim 8, wherein the outer cover  
20 has a shoulder<sup>211</sup> formed closer to an upstream side of the flow of the specified gas than the tapered surface of the inner cover to define an upstream portion of the gas path closer to the first gas inlet hole of the outer cover and a downstream portion of the gas path closer to the second gas inlet hole of the inner cover, the downstream portion  
25 being greater in area than the upstream portion in a direction traversing the longitudinal direction of the gas sensor.

13. A gas sensor as set forth in claim 8, wherein the outer cover has formed on the side wall thereof a shoulder which tapers off to a side of the first end of the gas sensor to define a wider portion of the gas path between the tapered surface of the inner cover and the shoulder of the outer cover, and further comprising a groove formed in a portion of the side wall of the outer cover closer to the first gas inlet hole than the shoulder of the outer cover, the groove serving to direct the flow of the specified gas to the second gas inlet hole of the inner cover.

14. A gas sensor as set forth in claim 13, wherein the groove has a length extending in alignment with the second gas inlet hole of the inner cover in the longitudinal direction of the gas sensor.

is groove on  
inner or outer cover?  
where is said alignment?